



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,922	06/23/2003	Yaolong Chen	90113	7549
24628 7590 04/18/2007 WELSH & KATZ, LTD 120 S RIVERSIDE PLAZA 22ND FLOOR CHICAGO, IL 60606			EXAMINER LAZORCIK, JASON L	
			ART UNIT 1731	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE 3 MONTHS		MAIL DATE 04/18/2007	DELIVERY MODE PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/601,922

Applicant(s)

CHEN ET AL.

Examiner

Jason L. Lazorcik

Art Unit

1731

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10,12-14,17-24,27-35,37-43 and 45-64 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10,12-14,17-24,27-35,37-43 and 45-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 46 and 47 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, applicants limitation of the separating body as being "spherical-cap-like" in line 2 of each claim fails to clearly and unambiguously set forth the metes and bounds for which the applicant seeks patent protection. Applicant is further requested to review the claim language for any further instances of the term "spherical-cap-like" and to amend the claims in accord with the above cited.

Allowable Subject Matter

The indicated allowability of claims 25, 26, and 36 is withdrawn in view of the newly discovered reference(s) to Sakata (US 4,047,469). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1731

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-10, 12-14, 17-24, 27-35, 38, 40-50, and New Claims 51-53 and 55-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lipkins (US 3,088,253) in view of Sakata (US 4,047,469).

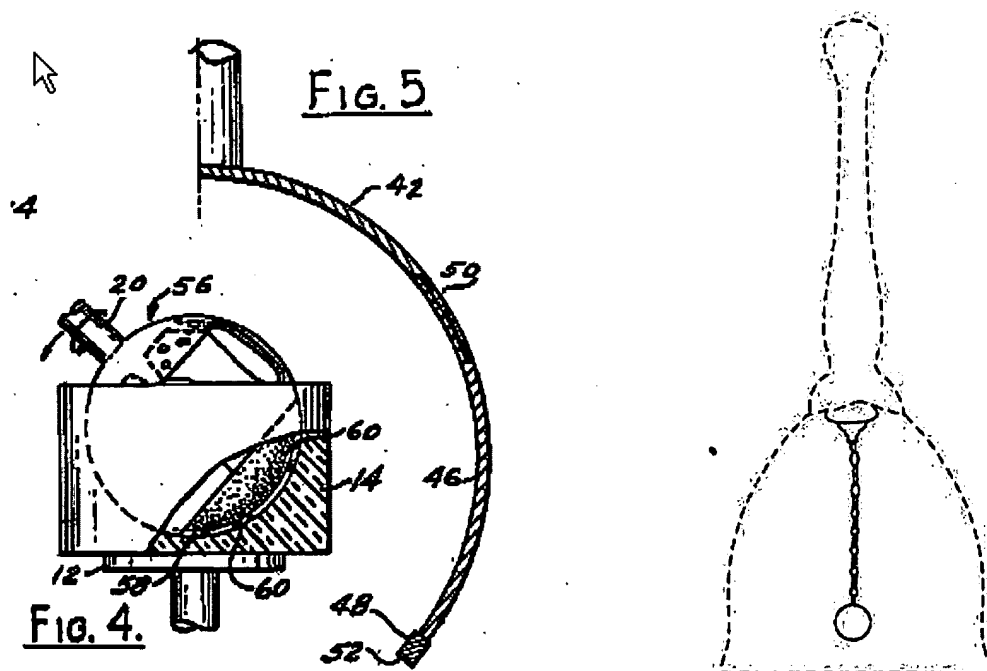
Regarding Claims 1-6, 8-10, 12-14, 1, 41-43, 46-48, , Lipkins teaches the production of "a spherical part from a body of fracturable material and at the same time providing a spherical hollow in the body of the material" (Column 1, Lines 8-11) and that the materials of construction of said body include hard, fracturable materials such as quartz (Column 1, Lines 15-18). Through a single cutting operation, two optical elements are simultaneously produced with one having a generally convex shape and the other presenting a generally concave shape. This process of producing the spherical cut is accomplished by advancing a spherical or "bell shaped" carrier with a diamond edged on the circumference or periphery thereof through the body material. Both the receptacle supporting the body material and the cutter are rotated about respective axes or "a rotating axis which passes through a center point" while the cutter is further swung gradually through an angle to increase its penetration into the body" (Column 1, Lines 41-48). Since both optically transparent pieces resulting from the cut

have curved surfaces, they are inherently understood to perform in the capacity of a lens or optical element.

It is here noted that the spherical carrier disclosed in the Lipkin document is broadly understood as being in "the form of a bell" and therefore reads upon the applicants "spherical-cap-like separating body with a partial spherical shell in the form of a bell". The following images compare the cutting devices disclosed by applicant with a generally bell shaped outline

(<http://images.replacements.com/images/images2/crystal/R/P0000226202S0009T2.jpg>)

Further, Lipkin indicates that the diamond-edged cutter with a spherical carrier has "approximately the same radius as the desired cut" (Column 1, Line 43-44).



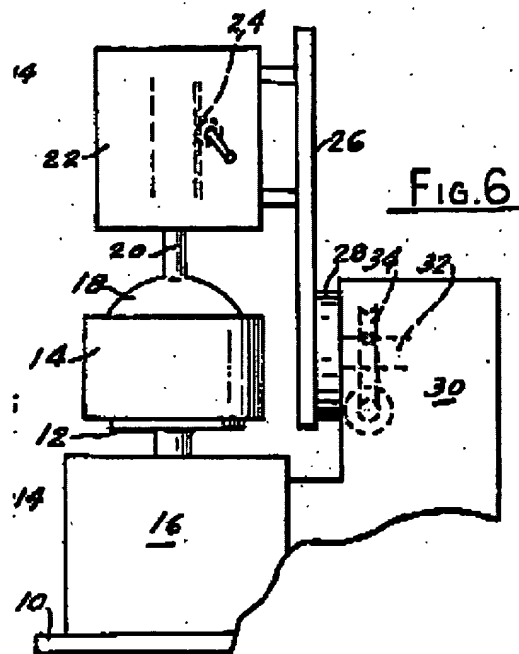
Regarding Claim 7, Lipkins did not teach producing lenses from calcium fluoride, barium chloride, magnesium fluoride or lithium fluoride. Lipkins only mentioned fused

Art Unit: 1731

quartz, silicon and germanium by name. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the method of Lipkins to make lenses from the claimed materials because those are frangible materials which are very similar to fused quartz, silicon and germanium and a person of skill in the art at the time the invention was made would have expected the similar materials to react similarly in a cutting method.

Regarding Claim 17, it is also clear from the above excerpt from Lipkin that the spherical carrier provides a bore in which the but body can be accommodated and which is supported on its outer circumferential wall (42) by a holding device and the cutting elements (48, 52) are arranged on the inner circumference of the shell.

Claims 18 through 20 are rendered obvious from the device depicted in the instant reference Figure 6 where a clamping device secures the shaft (20) of the spherical carrier in what is broadly interpreted as a "cylindrical housing". It is further noted that this mechanical arrangement is routinely utilized in commercially available drill press devices and would have been an obvious mechanical interconnect for one of ordinary skill.



Regarding Claims 27-30, Lipkin teaches that the inner part of the body being cut (e.g. the convex surface) can be supported by an adherent support, similar to the support of the body itself, where there is no interference between the cutter and the support.”(Column 1, Line 70 to Column 2, Line 3, and column 4, Lines 8-34). It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize any adhesion means appropriate including pneumatic, mechanical, hydraulic, or magnetic to secure the separate pieces of the body as described. Further, since the body receptacle is provided with a rotational driving force, it would be necessary and obvious to one of ordinary skill in the art to provide the upper receptacle with a “follower device” in order to avoid generating stress at the interface between the cutting surface and the body during a cutting operation. This follower device and body receptacle will naturally be rotationally displaced in the direction of the rotating axis which passes through the pivoting point during a normal cutting operation as disclosed above. Finally,

Art Unit: 1731

since both the upper and lower segments of the body are secured to receptacles as disclosed above, it would be obvious to maintain both pieces of the body under a nominal tensile stress during the cutting operation in order to insure that the spherical cutting body is not placed under an undue compressive force which could increase the frictional wear upon the cutting body.

With respect to Claims 32 –35, 37, and 40, 55, Lipkins teaches (See figures 2,3, and 5) a separating body divided into 2 or more parts which upon assembly provide pass through depressions, bores, or grooves which penetrate the thickness of the wall of the spherical carrier or the circumferential wall. The grooves are integral with or “fluidly connected” to the cutting elements.

Regarding Claim 38, 49, Lipkin indicates that the spherical cutter has a “cutting edge of diamond dust imbedded in a suitable metal carrier”. Where the diamond dust particles are understood as the cutting elements, the cutting elements are understood to be irregularly arranged on the separating body or the spherical carrier (Column 2, Line 67-69).

Applicants current amendments for Claims 1 and dependents, Claim 8 and dependents, previously presented Claims 21-24, 31, 45, and 50, and New claims 51-53, 55, 56-58, and 59-64 all set forth limitations drawn to a vibration damping feature incorporated into the method or the device for producing optical elements. Since Applicants amendments present a spectrum of subtle permutations upon this particular limitation which vary both in scope and content, they will here be summarized by the Examiner.

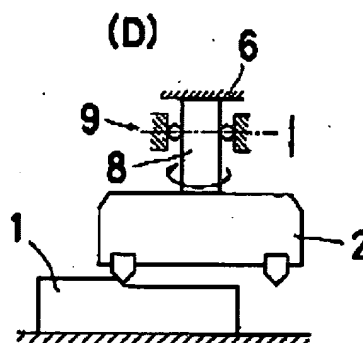
Claims 1 and 8 drawn to the method require “placing a mechanical vibration damping element on the circumference of a separating body and adjusting its radial position to lessen vibration”. New Claims 63, 64 broaden the scope of the method claims 1 and 8 by requiring only “a vibration damping element” instead of the “*mechanical* vibration damping element” of the prior claims. Similarly, new claims 59-61 drawn to the device require a general vibration damping element or “placing a vibration damping element on the circumference of a separating body and adjusting its radial position to lessen vibration”

Claim 31 broadly requires that “the separating body has a vibration-damping construction, while Claims 45 and 50 require “providing a vibration damping to said separating body. Claim 55 requires that the separating body “has a mechanical damping elements”, Claim 56-58 require that “a moving damping element is on the circumference of the separating body, and Claim 62 requires “a mechanical movable damping element is on the circumference of the separating body”

Claims 21-24 variously require placing damping elements on a cylindrical housing, or integrating the damping element into, or connecting the damping to one or both sides of the part-spherical shell. Claim 51 combines limitations drawn from Claims 21-24 in addition to the requirement that the mechanical damping element be displaceable in the radial direction of said partial-spherical shell. Claim 52 further limits claim 51 by requiring that the mechanical damping elements be displaceable under open or closed-loop control.

As set forth in the previous Office Action, Lipkins (US 3,088,253) is silent regarding the inclusion of a damping element with the disclosed cutting device. Sakata (US 4,047,469) teaches a method and device for suppressing "self-excited chatter vibrations" in a rotating tool.

The Sakata reference begins by indicating that when a bit is not stable during a workpiece cutting operation, machine vibrations cause "the surface of the workpiece thus machined (to become) sinusoidal" and that a different sinusoidal pattern is realized on each substrate for each machining operation (Column 1, lines 5-50). Sakata continues by teaching that "continuously sliding and reciprocating the chatter suppressing mass on the tool or on the tool spindle to shift the contact pressure" alters that natural frequency of the tool system during machining and suppresses the chatter vibrations (Column 1, lines 53-67). Stated alternately, Sakata teaches that "as the auxiliary holder moves to-and-fro on the tool, the rigidity of the workpiece accordingly varies with the result that successive sinusoidal waves have a different phase from each other, thus finally suppressing the self-excited chatter vibration in the tool system." (Column 4, Lines 18-27).



A diagrammatic representation of the Sakata chatter suppressing device or "mechanical movable vibration damping element" is depicted in the figure 5(d) excerpt above. Although Sakata does not specifically limit the type of tooling for which the instant device is applicable (Column 3, lines 58-61), the inventive device is shown in figure 5(d) with particular application to a rotating part-spherical tool of the general type taught in the Lipkin '253 patent. As clearly depicted by the arrows near auxiliary holder (9), the vibration suppression mass is reciprocated in the radial direction of the tool. Further it is important to underscore the point that Sakata disclosure also allows provision for the mass to apply vibration suppression "on the tool or on the tool spindle" as indicated above. Finally, although Sakata places no particular limitation upon the drive element for the disclosed vibration suppression element, it is the Examiners position that a feedback control device would have been a mere obvious extension over the prior art of record.

With the Sakata disclosure in mind, it would have been obvious to one of ordinary skill in the art at the time of the invention to suppress cutting tool vibrations in the Lipkin machine by incorporating the vibration suppression element taught in the Sakata reference. The Sakata vibration damping element would have been an obvious modification to the Lipkin apparatus for anyone seeking to optimize the quality of an as cut optical element by suppressing vibration induced sinusoidal surface waves.

Claim 39 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lipkins (US 3,088,253) and Sakata (US 4,047,469) as applied to claim 12 above, and further in view of Lipkins (US 3,159,952). The combined prior art did not teach wedge-shaped

Art Unit: 1731

cutting elements. Lipkins '952 taught the use of wedge shaped cross-section cutting elements (see figures 5-7 and col. 3, line 71 to col. 4, line 64). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a cutting element from Lipkins '952 in the cutting element of prior art because Lipkins '952 taught that it would have helped produce a continuous spherical surface at the final point of breaking of the inside part from the outside part of the material.

Response to Arguments

Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

In response to applicant's arguments regarding Claims 12-14, 17-24, 27-35, and 38 that Lipkins does not teach production of two lenses simultaneously, a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. To this end, the previous Office Action dated October 26, 2007 clearly indicated that from the single body of optical material one convex and one concave shaped body are formed. Therefore, absent any unexpected evidence to the contrary these curved bodies of optical material are understood to provide a function optically as a lens.

Applicant's arguments with respect to claims 21-24 have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Lazorcik whose telephone number is (571) 272-2217. The examiner can normally be reached on Monday through Friday 8:30 am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on (571) 272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JLL


STEVEN P. GRIFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Application/Control Number: 10/601,922
Art Unit: 1731

Page 13